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MONTHLY REPORT

1 April - 30 April 1959

RESEARCH AND DEVELOPMENT BRANCH
ENGINEERING STAFF

NSA Declassification/Release Instructions on File

EXTERNAL PROJECTS SECTION

1. PROJECTS AND ACTIVITIES

25X1A5A1

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2037 AGENT HIGH-SPEED COMMUNICATIONS SYSTEM, RS-16 - [REDACTED]

Delivery of the first RS-16B field set from the [REDACTED] Company is scheduled for 15 May 1959. The remaining 9 units are to be completed at the rate of one per week. Delivery of the 10 RS-16C field sets from [REDACTED] will begin during the week of 11 May 1959.

25X1A5A1

2047 CACHING AIDS AND TECHNIQUES - [REDACTED]

25X1A9A

The [REDACTED] Company has developed a water pressure tank to aid in checking out sealing methods. Work to date has consisted of studying various tapes to determine their feasibility as seals.

25X1A5A1

2056 HAND CRANK GENERATOR, HG-3 - [REDACTED]

25X1A9A

The [REDACTED] has delivered the initial engineering model of the HG-3 using a gear in the first stage and timing belts in the second and third stages of the gear train. A second engineering model which will be packaged in a plastic case and use gears only will be delivered in May.

25X1A5A1

2069 AGENT RADIO SET, RS-11 - [REDACTED]

25X1A9A

Results of the R&D Laboratory's analysis and appraisal of the modified RT-11 transmitter have been evaluated and final development specifications for the RT-11 are now being prepared.

2070 INFRARED COMMUNICATIONS DEVICES - [REDACTED]

25X1A9A

Several prototype optical systems for the IS-5 have been delivered for evaluation by [REDACTED]. From preliminary testing, these systems appear to be satisfactory. The delay caused by the switch from [REDACTED] when the former declined to supply the optical systems has slowed down progress on this program; however, the contractor reports that every attempt will be made to meet the required delivery date of 30 June 1959.

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- 2082 AGENT AUTOMATIC KEYING DEVICES, CK-7 - [] 25X1A9A
- Approximately 90 CK-7 Coder/Keyers have been received from the contractor. The remaining 10 units and spare parts will be delivered during the next reporting period.
- 25X1A9A 2089A HIGH-SPEED COMMUNICATIONS AND PROCESSING SYSTEM, AS-4A - []
- AS-4/AS-4A operational testing between [] continued this period. Future modifications and/or changes will be based upon OC-T reports on results of these tests. (See Conference Report: [] Company - T.O. 3 dated 14 April 1959) 25X1A6B
- 25X1A5A1 2095 AGENT TRANSISTOR RECEIVER, RR/D-11 - [] 25X1A9A
- A fixed price quotation of \$201,372. for the fabrication of 100 RR/D-11 (3 to 30 mc) receivers and 50 RR/E-11 (3 to 12 mc) receivers has been submitted by []. Contractual action for the procurement of these receivers is being initiated. Delivery date for the nine RR/D-11 receivers expected in April is now given as 15 May 1959. 25X1A5A1
- 2096 AGENT EQUIPMENT POWER SOURCES - [] 25X1A9A
- The thermoelectric generator, BC-7, developed by [] 125X1A5A1 currently undergoing tests at the R+D Laboratory.
- The BC-11X thermoelectric generator being built by [] 25X1A5A1 failed during testing by the contractor. Investigation showed that the solder on the cold junction had melted, thereby causing an open circuit in the generator. The contractor has asked for a time extension up to 1 June 1959 in order to rebuild the BC-11X.
- Work began on the 10-watt thermoelectric generator to be built by the [] 25X1A5A1
- Development of a water-activated battery was started in April by [] 25X1A5A1
- 25X1A5A1 The Office of Logistics is currently negotiating a contract with the [] for a light-activated battery. (See Trip Report: Silver Cadmium Batteries dated 15 April 1959)
- 25X1A5A1 2097 AGENT TRIPHASE COMMUNICATIONS SET, RS-18 - [] 25X1A9A
- Contractual arrangements have been made with [] to 25X1A5A1 design and fabricate an engineering model of an automatic receiving station for the RS-18 field set. From 22 to 26 April, the RS-18 field sets underwent engineering/operational testing between San Antonio, Texas and Washington, D. C. (See Status Report: RS-18 Engineering/Operational Field Tests dated 30 April 1959)

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2099 HIGH-SPEED AGENT TO SUB-BASE COMMUNICATIONS SET, RS-13B-

This program has been terminated and will no longer be reported.

2103 AUTOMATIC DATA TRANSMISSION SYSTEM, AS-6 - 25X1A9A

On-the-air tests of the AS-6 field unit were held during April between Los Angeles and Washington. The AS-6 was matched to the TSS collector unit and to the AEC radio-isotope power supply. A series of fully simulated operational tests will be made at beginning 15 May.

25X1A6A

2104 UNIVERSAL MODULAR SUBASSEMBLIES, TAILOR - 25X1A9A

The contractor is completing fabrication of the transmitter modules being procured under the prototype contract.

2104A TAILOR MODULAR RECEIVER, RR-22 - 25X1A9A

Progress on this program is satisfactory. Results of the R+D Laboratory evaluation of the initial Band I engineering model have been given to the contractor.

2108 AGENT AUTOMATIC STATION, AS-3 - 25X1A9A

Favorable results were obtained in operational testing of the AS-3 during April. The contractor has devised a modification for the CO-3 coder to provide more reliable operation and has completed delivery of all AS-3 prototypes with the exception of eight AC power supplies. is preparing a cost estimate for quantity production of the AS-3. (See Trip Reports: AS-3 dated 17 April 1959 and AS-3 Tests dated 23 April 1959)

25X1A5A1

2110 RADIO CIRCUIT DEVELOPMENT - 25X1A9A

The equipment developed under this project is still awaiting evaluation by the R+D Laboratory. Priority ratings for this equipment are presently being reestablished.

2112 DZ LOCATION SYSTEM, BN-1 - 25X1A9A

A task outline for the development of a DZ beacon has been written and will be forwarded to several contractors with requests for proposals.

2113 60-DAY PROGRAM TIMER, CU-2 - 25X1A9A

Repair of the 21 faulty CU-2 units continued at the contractor's plant. Progress on this project is considered satisfactory.

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- 2114C SUBMINIATURE RECORDER, CB-7 - [] 25X1A9A
- A breadboard model of the modified CB-7 was demonstrated by the contractor. Results of this demonstration were quite favorable and the unit was turned over to SPS/EA for evaluation and examination. (See Conference Report: Subminiature Recorder, CB-7 dated 30 April 1959)
- 2114E SPECIAL PURPOSE TAPE TRANSPORT - [] 25X1A9A
- Delivery of the first tape transport was made by the contractor during this reporting period and the unit exceeded all expectations for an equipment fabricated in the short period of time allotted. The contractor is making satisfactory progress towards the completion of this task. Delivery of the two remaining tape transports is scheduled for the next reporting period.
- 2115 TIME AND EVENT MARKER, IN-7 - [] 25X1A9A
- Progress by the contractor on the fabrication of 15 IN-7 prototypes and the design and development of a ruggedized version of an IN-7 engineering model has been satisfactory.
- 2116 SIGNAL ACTUATE DEVICE, CU-3 - [] 25X1A9A
- A request has been forwarded to the Office of Logistics to provide for the fabrication of 16 CU-3 prototypes by the []
- 25X1A5A1 [] The electronic package necessary for activation of the CU-3 will be supplied to the contractor as GFE and will be installed in the CU-3 prior to final testing. The contractor was authorized by the Office of Logistics to proceed with this task.
- 2117 MINIATURE COAXIAL CABLE TRANSMISSION SYSTEM, WS-1 [] 25X1A9A
- []
- The first WS-1 prototype is currently undergoing test and evaluation by OC-SP. Test results will be reported as soon as they are available.
- 2121 MINIATURE AGENT VFO, OS-4 - [] 25X1A9A
- R+D Laboratory evaluation of the initial OS-4 prototype demonstrated the unit's excellent resettability and calibration accuracy. The VFO has been turned over to OC-T for operational evaluation and the contractor has been asked to submit a quotation for quantity procurement.

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2122 AGENT SHORT-RANGE COMMUNICATIONS SET, RS-19 [] 25X1A9A

The prototype RS-19 field unit has been delivered to the Agency and will be forwarded to the R+D Laboratory for evaluation. One of the receivers delivered under Phase A of this contract has been modified by Motorola to operate on 7 megacycles, the operating frequency of the newly delivered equipment. The RS-19 program is being expanded to allow for the development of base facilities to work with the field unit.

2123 100-WATT FIELD STATION TRANSMITTER, RT-27 - [] 25X1A9A

The initial RT-27 prototype was received from the contractor and is now being evaluated at the R+D Laboratory. [] has been 25X1A5A1 asked to submit recommendations for production redesign and a meeting with SEB and OC-T will be arranged to consider the suggested improvements.

2124 RADIO RELAY SYSTEM, RS-23 - [] 25X1A9A

Three complete RS-23 prototype systems were received and forwarded to SP/AF for inspection and test. The nine remaining systems of the contract quantity of twelve are undergoing final testing by the contractor. The Office of Logistics has been requested to arrange special classified handling and shipping procedures for these units.

2127 SEARCH RECEIVING SYSTEM, CS-8 - [] 25X1A9A

Circuit layouts for the prototype CS-8 production model are now being checked out prior to final packaging. The contractor has stated that the task cannot be completed within the time and funds allotted to the contract. An overrun figure, including no fee, has been submitted; completion date of the contract will be extended into July 1959.

2131 MINIATURE 3-CHANNEL DATA RECORDER, CB-3 - [] 25X1A9A

25X1A5A1 Repair of the [] CB-4 playback recorder is proceeding satisfactorily and delivery is scheduled for the next reporting period. The R+D^h Laboratory was unable to complete evaluation of the [] CB-3 25X1A5A1 and CB-4 recorders due to the presence of high noise on all three channels of the CB-3 recorder. The CB-3 has been returned to [] 25X1A5A1 [] for correction of the troubles encountered and additional minor changes have also been requested. Delivery is scheduled for the next reporting period. (See Conference Report: Miniature Data Recorder, CB-3, dated 13 April 1959)

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2132 CARRIER RECEIVING SYSTEM, WR-1 - [REDACTED] 25X1A9A

Five prototype WR-1 receivers have been fabricated and are being held by the contractor pending shipment of 52 [REDACTED] F455-6 single sideband filters. These are expected in June when final testing will be completed and shipment of the five prototype equipments accomplished. 25X1A5A1

2133 HIGH-SPEED FIELD STATION, AS-5 - [REDACTED] 25X1A9A

AS-5 breadboard tests are nearly completed. Purchase of a second AS-5 is still under consideration. A decision to provide the AS-5 with a narrowband capability (5.5 kc) is pending. (See Conference Report: [REDACTED] T.O. 5 dated 14 April 1959) 25X1A5A1

2136 VISUAL DISPLAY SYSTEM, DS-1 - [REDACTED] 25X1A9A

The DS-1 equipment has been received at Headquarters and will be evaluated by the R+D Laboratory following demonstrations of the equipment to Agency personnel. A time extension of six weeks has been granted to [REDACTED] to complete the final report for this project.

25X1A5A1

2137 MAGNETIC CODER/KEYER, CK-8 [REDACTED] 25X1A9A

The initial prototype CK-8 Coder/Keyer is scheduled for delivery during the first part of May. A tape cartridge from the AS-3 equipment has been delivered to the contractor to ensure mechanical compatibility between AS-3 and CK-8 equipments. (See Telecon Report: Keying Circuitry, CK-8 dated 14 April 1959)

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2138 [REDACTED] ANTENNAS - [REDACTED] 25X1A9A

The contractor has procured a new solenoid to replace the field's Band 5 solenoid which was found to be defective. Additional replacement items will be sent to [REDACTED] as soon as they are received by the contractor. Instruction manuals were delivered to Headquarters and have been forwarded to the field. 25X1A2D1

2139 AUTOMATIC DATA STORAGE AND READOUT SYSTEM, CS-11 - [REDACTED] 25X1A9A

The prototype modules are nearing completion. Design of system controls and computation of required battery capacity are two principal areas in which much work remains to be done. Uncertainty in these areas is due mainly to the unavailability of complete information on the functional characteristics and power requirements of the GFE equipment. Wiring diagrams of this GFE equipment have been drawn and sent to the contractor to relieve this situation. (See Trip Report: CS-11 Collection System dated 17 April 1959)

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2140 AGENT TRANSMITTER, RT-21 - [REDACTED]

25X1A9A

The problem of automatically matching antenna impedances of 25 to 1300 \pm j1000 ohms has been resolved analytically. Work will now progress toward a breadboard model of the antenna network for test and evaluation. (See Trip Report: RT-21 Transmitter dated 30 April 1959)

2141 STUDY FOR UNCONVENTIONAL AGENT SET, RS-24 - [REDACTED]

25X1A9A

[REDACTED] has selected a unique phase modulation method as the optimum technique for this low-detectability agent set. Additional funds, to the extent of \$142,000, will be necessary however to construct breadboards and demonstrate long-distance feasibility. The course of future work under this program is being studied. (See Conference Report: RS-24 Agent Set dated 30 April 1959)

2141A STUDY FOR NOISE-MODULATED AGENT SET- [REDACTED]

25X1A9A

[REDACTED] has made arrangements for a conference in May to discuss the preliminary draft of their final report on this study program.

2141B STUDY FOR METEOR BURST AGENT SET - [REDACTED]

25X1A9A

The contractor is completing a draft of the final report to be submitted on this study.

2142 CLANDESTINE ELINT ANTENNAS - [REDACTED]

25X1A9A

Specifications covering the development of two complete ELINT antenna systems including four antennas, twelve band-pass filters, four detectors, and four equipment boards have been written and will be forwarded to the contractor. Upon receipt of a satisfactory proposal from the contractor, two complete systems will be fabricated.

2143 TRAVELING WAVE TUBE AMPLIFIERS [REDACTED]

25X1A9A

The contractor has been supplied with the sterile Franconia mailing address for covert procurement and instructions for shipping the first lot of equipment. Progress on the remaining TWT's is satisfactory. (See Trip Report: Traveling Wave Tube Amplifier, 14 April 1959)

2145 PORTABLE MAGNETIC TAPE RECORDER/REPRODUCER, CB-9 - [REDACTED]

25X1A9A

The CB-9 recorder development program is progressing toward a solution of the miniaturization problems involved. Breadboards and sample sub-assemblies have been fabricated and tested for incorporation in the engineering model due to be delivered in October 1959. The most favorable transport design appears to be a three-motor drive system.

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2146 LONG-RANGE ELINT DATA TRANSMITTER, CS-15 - []

25X1A9A

A report stating the technical and operational characteristics of the proposed CS-15 system has been submitted by SPS to the Technical Requirements Board for ELINT Operations. Further work on this task has been suspended pending a reaffirmation of the operational need for such a system.

2147 SPECIAL PURPOSE RECORDERS, CB-12, CB-13 and CB-14 - []

25X1A9A

Development work on this project was interrupted this period to allow for laboratory evaluation of the CB-13 and for negotiation of a contract amendment to provide additional funds and time to complete work on the CB-14.

2148 SEARCH RECEIVER, CS-5 - []

25X1A9A

Four contractors have elected to bid on the CS-5 search receiver and technical proposals are to be submitted by 4 May 1959. A conference was held with each potential contractor during this reporting period prior to the contractor's submission of a proposal.

2149 TRAVELING WAVE MASER - []

25X1A9A

The laboratory model of the traveling wave maser is now being tested by the contractor. Although complete data on operating characteristics has not yet been taken, the system design has been proven sound. The only trouble encountered to date has been with the niobium superconducting solenoid.

2150 CLOSED CIRCUIT TELEVISION, TV/CC-1 - []

25X1A9A

25X1A5A1

The [] has requested an additional three weeks in which to prepare their technical and cost proposal for development of the TV/CC-1 closed circuit television system. It is now expected that the proposal will be submitted during the first part of the next reporting period.

2151 CONDUCTING GLASS ANTENNAS []

25X1A9A

Pending results of the R+D Laboratory evaluation of the four sample glass antennas received from the contractor last month, negotiations will be started with [] to discuss the feasibility of constructing a practical antenna system of conducting glass.

2152 MINIATURE MICROWAVE COMMUNICATIONS SYSTEM []

25X1A9A

The miniature microwave communications system has been designated the RS-29. The task outline for this system has been submitted to the [] for a final cost and analysis statement.

25X1A5A1

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[REDACTED]

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2153 PHOTOGRAPHIC CIPHER SYSTEM - [REDACTED] 25X1A9A

25X1A5A1

The [REDACTED] has reported very encouraging results from their initial research program on the potential application of [REDACTED] paper in the photographic cipher system. A proposal was requested, and received, from [REDACTED] for the development of a working system. This proposal and cost analysis are now being evaluated by the interested Divisions. (See Trip Report: Photographic Encipher System dated 21 April 1959 and Conference Report: Photographic Cipher System dated 5 May 1959)

25X1A5A1

25X1A5A1

2154 HIGH-SPEED FIELD STATION, AS-9 - [REDACTED] 25X1A9A

After a careful analysis of four proposals for the AS-9 communications system, it was decided to suspend the program, since none of the approaches considered appeared likely to provide a significant improvement over a modified AS-5 system.

2155 COLD CATHODE TUBES - [REDACTED] 25X1A9A

Necessary clearances have been obtained for personnel of the Tung Sol Electric Corporation to allow discussion of Agency requirements for low-power-drain high-power-output cold cathode tubes. A meeting with appropriate personnel will be arranged in the near future.

2627 VARIABLE SPEED TAPE RECORDER/REPRODUCER, BT-7 - [REDACTED] 25X1A9A

A revised delivery date for the BT-7 prototype is given as 11 May 1959. To date, the contractor has redesigned the front panel layout and added a tape "footage" counter. Work remaining involves the installation of subassemblies and an equipment checkout. A visit to the contractor's plant is tentatively scheduled for the second week of May. If the prototype is found to be acceptable at this time, it will be brought back to Headquarters for a systems test at [REDACTED]

25X1A6B

2638 AUTOMATIC DIGITAL TRANSMISSION SYSTEM, AS-8 - [REDACTED] 25X1A9A

A request for termination of the AS-8 program is now being prepared. No further R&D activity is expected under this project.

2639 VHF COLLECTION RECEIVER, CR-2 - [REDACTED] 25X1A9A

The fabrication of four prototype receivers is proceeding on schedule and is 80% complete. All electrical components have been procured. Some mechanical redesign work requested by the project engineer is in progress.

2640 SIGNAL DELAY DEVICE - [REDACTED] 25X1A9A

25X1A5A1

The [REDACTED] has been selected as the contractor to fabricate 22 signal delay devices. (The equipment requirement was increased from 20 to 22 units during this reporting period.) A request for contract initiation was forwarded to the Office of Logistics and approval was given [REDACTED] to start work on this task.

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[REDACTED]

25X1

2642 PHOTOGRAPHIC DATA RECORDING TECHNIQUES - [] 25X1A9A

A report from Wright Air Development Center, Dayton, Ohio, states that GE is continuing company-sponsored research on a thermo-plastic recording technique. GE is expected to have a service test model recorder sometime during this calendar year. It appears that the Air Force plans to accept the GE proposal, which was reviewed by Commo earlier this year, as soon as FY 60 funds become available.

2643 TRANSMITTER ADAPTER FABRICATION, TA-1C - [] 25X1A9A

Headquarters is presently awaiting delivery of the reworked prototype from [] Upon receipt, it will be re-evaluated for acceptance.

2644 INFLATABLE HIGH-GAIN POUCHABLE ANTENNAS [] 25X1A9A

[] has procured nearly all the parts for these antennas and is presently measuring antenna characteristics. The VSWR is less than 3.2 to 1 over the range of operation. One unilateral side lobe only 8 to 10 db down and poor gain characteristics at higher frequencies have given the contractor some trouble, but this has been traced to unevenness of the bag surface. Delivery of one antenna is expected very shortly. (See Telecon Report: [] 25X1A5A1 Company dated 28 April 1959)

2648 CS-8 BROADBAND ANTENNA REQUIREMENT, AN-20 - [] 25X1A9A

Characteristics of this antenna are being measured by [] 25X1A5A1 from 30 to 55 mc. [] will specify the antenna as covering 25X1A5A1 the range of 30 to 600 mc with degraded performance from 30 to 55 mc as per our request. The antenna is expected to be ready for final acceptance the first week in May.

2649 GUARDBAND RECEIVER, CR-16 - [] 25X1A9A

Design work on the breadboard model of this 30 to 260 mc VHF receiver continued. A preliminary RF tuner using a three section Mallory inductuner with a variable three section tuning capacitor has been completed. This tuner is reported to accomplish single band tuning over the 29 to 265 mc range. A [] Model No. 25X1A5A1 1302 receiver was furnished the contractor for comparison tests.

2651 ONE-TIME PAD, [] 25X1A9A

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25X1A9A

2652 SECTIONALIZED METAL PARABOLIC REFLECTORS AND FEEDS - [REDACTED]

Electrical tests at the contractor's plant are almost complete and results indicate that gain and side lobe suppression will meet our specifications. Delivery of the antennas is expected shortly, although the contractor has not yet committed himself to a firm date.

25X1A5A1

2655 MINIATURIZED TEST EQUIPMENT - [REDACTED]

25X1A9A

[REDACTED] has submitted a comprehensive proposal for the signal generator portion of this program. The cost of developing and fabricating one complete system is quoted as \$249,560 (CPFF). Delivery is quoted as 12 months. An estimate of the cost of 12 "production run" systems is quoted at \$20,000 each. A total of 7 signal generators will be required to cover the frequency range of 10 mc to 21 kmc.

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2656 [REDACTED] BAND COLLECTION RECEIVER, CR-17 [REDACTED]

25X1A9A

The operational requirement for the CR-17 has been dropped and work on this project will be temporarily suspended.

2657 RADIO RELAY SYSTEM, RS-28 - [REDACTED]

25X1A9A

The engineering model of this equipment has been completed except for final testing of Channel 2 in conjunction with a new ultrasonic microphone recently received from a subcontractor. Separate instruction books are being prepared for each of the four channels.

2660 RADIO RELAY REPEATER SYSTEM - [REDACTED]

25X1A9A

The most formidable problem expected in the development of this repeater system is the design of a suitable semiconductor VHF transmit-receive switch. If this can be accomplished, the same carrier frequency and antenna can be used on a time-sharing basis. Design effort has been concentrated on this problem.

2661 TRANSISTORIZED VHF MONITOR RECEIVER - [REDACTED]

25X1A9A

This equipment is in the very early stages of development. The audio amplifier, a 455 kc detector and carrier insertion generator, and a 455 kc amplifier have been breadboarded and tested.

2662 DATA REDUCTION CONSOLE - [REDACTED]

25X1A9A

Pending the receipt of security clearances, work on this project has been slow. Several small general purpose analog-digital computers are being studied as a possible approach to the problem of automatic data reduction. The cost of a complete rack-mounted automatic data processing system might run as high as \$300,000, or more, complete with input and output devices to satisfy the requirements.

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2663 MODIFIED [REDACTED] 130A VHF RECEIVER - [REDACTED] 25X1A9A

Contractual negotiations with [REDACTED] are still in progress. As soon as an amicable settlement can be worked out by the Agency's contracting officer, work on this project will begin.

2664 EQUIPMENT DEMONSTRATIONS - [REDACTED] 25X1A9A

On 15 April 1959, approximately 15 development items and 12 production items of communications interest were shown to a total of 120 persons in the Communications Conference Room of 'I' Building. Response was favorable. On 22 April, the 27 equipments were shown to the Technical Requirements Board and later to a group of approximately 35 persons, all Agency employees. Response to these demonstrations was also considered favorable. A demonstration of equipment for communications by means other than radio was scheduled for 27 April 1959 for representatives of the Technical Requirements Board.

2666 30 TO 1,000 MC ANTENNA SYSTEM - [REDACTED] 25X1A9A

25X1A5A1

A proposal for the development of five of these antennas has been accepted from [REDACTED] and contract negotiations are now in progress.

2667 ONE TO 10 KMC DF ANTENNA - [REDACTED] 25X1A9A

Work on this antenna is nearing completion and delivery of the unit is expected by 5 May 1959. The antenna will be accepted at the contractor's plant and then hand-carried to Headquarters to prevent any delay in shipment which might be inconsistent with the urgency of the operational requirement. (See Telecon Report: [REDACTED] dated 28 April 1959)

25X1A5A1

2. SERVICE CONTRACTS - [REDACTED] 25X1A9A

25X1A5A1

A. [REDACTED] (RD)XG-1604, T.O.'s C and D

Work Orders Completed during April 1959:

X Fabricate 231-D Indicator Panels	\$ 72.00
D Design and Fabricate VA-9 Prototype Unit	8,384.14

Work Orders Outstanding:

S Design and Fabricate 30 to 260 mc Receiver (T.O. C)	6,000.00
I Signal Operated Relay	8,960.00
N RS-1 Modification Kits	1,000.00
R Antenna Mounts	3,136.00
V Fabricate 20 Teletype Modification Kits	1,174.00
W Fabricate an Audio Carrier Interrupting Device, CU-9	450.00
Y Fabricate Video Patch Panels	3,825.00
Z Fabricate a Cryptographic Alarm Device	2,550.00

AA	Fabricate 2 Rack Panels	\$	117.00
BB	Fabricate Control Unit for Magnecord		1,200.00
CC	Fabricate 100 VA-9 Units		17,000.00

Dollar Balance Remaining, T.O. C	3,561.28
Dollar Balance Remaining, T.O. D	12,650.18

25X1A5A1 B. - RD-79, T.O. 15

Work Orders Completed during April 1959:

4 Frequency Extension Kits for 231-D	\$	856.00
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Work Orders Outstanding:

1 Evaluate Frequency Shift Converters	23,202.00
3 Speech Clipper for 231-D	6,910.00
5 AN/APR-9 Receiver Modification	3,538.00

Dollar Balance Remaining, T.O. 15	21,298.42
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25X1A5A1 C. RD-145, T.O. 5

Work Orders Completed during April 1959:

1 Fabricate Filter Traps	\$	2,420.17
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Work Orders Outstanding:

6 Fabricate Transistorized Power Supplies, PS-3	14,954.00
7 Design and Fabricate Electronics for Unit	4,073.54

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Dollar Balance Remaining, T.O. 5	22,944.84
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25X1A5A1 D. , RD-128, T.O. 3

Work Orders Completed during April 1959:

3 Measurement of a Reflex Slot Antenna	\$	3,300.25
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Work Orders Outstanding:

4 Design and Fabricate a Group of Receiving Antennas	24,397.03
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Dollar Balance Remaining, T.O. 3	2,302.72
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Chief, External Projects Section, R+D